

THE RELATIONSHIP AMONG  
TEST ANXIETY, ACADEMIC ACHIEVEMENT, AND AGE  
IN ASSOCIATE DEGREE NURSING STUDENTS

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by  
Cynthia C. Eubank  
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Cynthia C. Eubank

Approved by Committee:

Sandra L. Sellers  
Sandra L. Sellers, Ph.D., R.N.

Christine Denklaun Wood  
Christine Denklaun Wood, M.S.N., R.N.

Evelyn Anderson  
Evelyn Anderson, M.S.E.

## ABSTRACT

The purpose of this study was to examine the relationship among test anxiety, academic achievement and age in Associate Degree Nursing students. To test the relationship among the variables, two hypotheses were posed.

Employing a descriptive research design, data were collected through the Test Anxiety Inventory (TAI) (Spielberger, et al., 1980) and compared to the final course grades and ages of 107 first term, second year ADN students. Data were analyzed by the use of descriptive statistics, the Pearson product moment correlation coefficient, and the ANOVA. The alpha level was set at 0.05.

The findings of this study revealed that as test anxiety increased, academic achievement (course grade) of the ADN students significantly decreased ( $r = -0.31$ ,  $p < .05$ ). No significant relationship between age and test anxiety in the ADN students was found ( $p = 0.635$ ).

Recommendations for further research include early test anxiety assessment with interventions and follow-up test anxiety testing. Research that targets older students by specific ages may more clearly address age-related test anxiety influences.

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## CHAPTER ONE

### THE PROBLEM

#### Overview of the Problem

In associate degree nursing (ADN) education, classroom content is complex, the scope is broad, and the pace is accelerated. Frequent testing of students is necessary throughout the program for evaluation of progress in mastering content. Students entering the second year of an ADN program verbalize and exhibit a great deal of anxiety regarding course examinations. Student anxiety is not limited to examinations, but test-taking does appear to be the area of greatest concern. On numerous occasions, this anxiety seems to negatively affect academic achievement. In addition, there is speculation among some nurse educators that anxiety and academic achievement differ among various age groups. Younger students (19-25 years) seem to exhibit moderate anxiety, middle-aged students (26-34 years) exhibit considerably less anxiety, and older students (greater than 35 years) exhibit the highest observable anxiety in relation to testing.

Test anxiety can have short and long term effects on ADN students and their academic achievement may



decline. Academic achievement could be affected to the point of failure for some students, potentially eliminating any future for them in nursing. Others who are able to complete the ADN program may experience great difficulty with the National Council Licensure Examination (NCLEX). In addition, the graduates also may be hesitant or resistant to any future continued nursing education.

#### Purpose of the Study

The purpose of this study was to examine the relationship among test anxiety, academic achievement, and age. Specifically, this study examined the relationship among test anxiety, academic achievement, and age in second year, first term ADN students enrolled in a midwest community college.

#### Research Hypotheses

Two research hypotheses were posed for this study. They were;

1. There will be a significant inverse relationship between test anxiety and academic achievement in second year, first term ADN students.
2. There will be no significant difference in test

anxiety among second year, first term ADN students according to age.

The rationale for a directional hypothesis in hypothesis one was based on previous research that supports the notion that test anxiety negatively affects academic achievement. The null hypothesis was used for hypothesis two because no similar data were available in the literature to substantiate a directional hypothesis.

#### Definition of Terms

For the purpose of this study, the terms listed below were defined as follows:

Test Anxiety: A diffuse feeling of worry or discomfort accompanied by negative thoughts in relation to a testing situation as measured by a total score on the Test Anxiety Inventory (TAI) (Spielberger, Gonzalez, Taylor, Anton, Algaze, Ross, and Westberry, 1980).

Academic Achievement: Final course grade, computed in percentages. This percentage was determined by adding total points obtained on five unit multiple choice examinations and one comprehensive multiple choice examination. The total was weighted for each examination, divided by the number of points possible, and rounded to the nearest hundredth.

Age: Chronological self-reported age, in years, of students.

ADN Nursing Students: Students enrolled in the second year, first term of a two year Associate Degree Nursing program located in a midwest community college.

#### Overview of Conceptual Framework and Literature Review

Anxiety served as the conceptual basis for the study. S. B. Sarason, Davidson, Lighthall, Waite, and Ruebush (1960) believed that anxiety had its roots in early childhood with both developmental and environmental elements. They proposed that these elements are all linked to perceived feelings of insecurity and inadequacy that are carried into adulthood. These feelings served as Sarason et al.'s definition of anxiety.

Anxiety as a concept relevant to nursing was thoroughly developed by nurse theorist Hildegard E. Peplau (Peplau, 1952). Peplau viewed anxiety as a frequent consequence of tension resulting from perceived needs. If the need is strong, "all behavior is directed toward it..." (p. 80). Peplau believed that anxiety occurs in varying degrees. Mild anxiety frequently heightens alertness and problem-solving ability. As

anxiety increases, however, alertness and learning capability decline, and panic may ensue. Peplau further stated that "when needs are not met in direct ways, with subsequent lowering of tension, somatic (physiological) responses of greater intensity than is usual are activated. These responses, being more closely related to emotional and psychosocial needs than to structural difficulties in the organism itself, are usually called psychosomatic responses" (p. 83).

Test anxiety as a related concept has been defined by I. G. Sarason (1978). Sarason, an independent researcher and coauthor with Spielberger, believed that when characteristics of a person's anxiety are linked to examination situations, the anxiety could be labeled test anxiety.

The term "test anxiety" did not appear in the literature with great frequency until the 1960s and 1970s. Test anxiety, according to Spielberger (1979), consists of two primary components: worry and emotionality. Worry includes personal thoughts regarding poor test performance and ultimate course or academic failure. Emotionality includes physiological components such as fear, panic, tension, and increased heart and respiration rates. Both of these components

combine to potentially interfere with test performance in many situations.

There are many variables that have been identified as useful in predicting academic achievement (Chacko and Huba, 1991; Howell and Swanson, 1989). Test anxiety frequently has been investigated as one of these variables and appears to play a powerful role in academic achievement.

Spielberger (1966; 1979) was one of the first researchers to investigate test anxiety in a systematic manner. In 1966, Spielberger conducted studies in which he selected 24 high anxiety students and 24 low anxiety students enrolled in introductory psychology courses at Duke University and the University of North Carolina. Anxiety was determined using scores on the Taylor Manifest Anxiety Scale. Spielberger found that in testing situations, the higher anxiety group demonstrated overall poorer performance as task difficulty increased.

A later study conducted by Spielberger (1979) investigated anxiety and over-all grade point average. Participants were 140 high anxiety and 144 low anxiety students enrolled in introductory psychology classes at Duke University. Scholastic aptitude for these students

was determined using the ACE Psychological Examination. The ACE scores for groups I-V ranged from 62-102, 103-116, 117-126, 127-137, and 138-174 respectively. Graphic depiction of these results demonstrated a trend in which the 3 middle scholastic aptitude groups with high anxiety had lower grade point averages for the semester than their low anxiety counterparts. In addition, the ultimate failure/drop-out rate for the same high anxiety students was 20% compared to 6% of the same low anxiety students.

The Test Anxiety Inventory (TAI) (Spielberger et al., 1980) was developed to specifically analyze test anxiety components in a research setting. Spielberger compared TAI scores for 195 male navy recruits and 72 female navy recruits with scores on recruit training examinations. Negative correlation results of -0.34 and -0.19 respectively were obtained when recruitment scores and anxiety scores were compared. Spielberger concluded that test anxiety has a negative effect on academic achievement.

There are numerous studies supporting Spielberger's original research, but in nursing education no research was discovered that specifically investigated test anxiety and academic achievement. In addition, two

literature searches have yielded virtually no nursing education studies specifically targeted at test anxiety, academic achievement and age, or any combination of these variables.

Spielberger (1979) and Knowles (1980) suggested some aspects of aging that may contribute to stress and anxiety. These include a decline in physical capacity, decreased self-confidence, decreased job mobility, fewer opportunities, and approaching age of retirement with concurrent feelings of limited time to complete an education.

#### Significance to Nursing

Nursing education and the students it attracts have changed significantly. Until a few years ago, career options for women were limited, and nursing educational programs had many applicants. Because of this, nursing programs could select students with higher aptitudes or demonstrated abilities. Green (1987) concluded that interest in nursing as a major course of study among first time full-time women enrolled in 4-year colleges declined from a high of 8.5% to 3.7% in 1986. Merritt (1991) believed this change in interest in nursing mirrors the shift in student preferences away from more

traditional women's roles.

Today, more nursing education students fall into the middle ability category, possibly due in part to increased career choice options and the emergence of two-year community college ADN programs. Achievement scores reflect this middle ability trend. For example, the ASSET test (an adult academic achievement test) score means for second year ADN students (1991-92) enrolled in the nursing program used in this study were: Reading-43.1, Language-43.02, and Numerical-39. National Asset score means (1991-92) were: Reading-40.73, Language-41.01, and Numerical-39.05. A comparison of scores from each group indicates similar results reinforcing the notion that ADN students perform at the national average. Studies show a greater failure rate for students in this ability group who exhibit high levels of test anxiety (Spielberger, 1979).

Green (1987) reported that the average Scholastic Aptitude Test (SAT) composite score for fall 1987 nursing majors was 217 points lower than the national average for non-nursing majors. American College Test (ACT) scores also have declined. Green reported a 1985 National League of Nursing survey that led to data indicating that over 50% of generic Bachelor of Science



in Nursing (BSN) programs have remedial courses available to students in reading, math, and study skills.

I. G. Sarason (1972) believed "correlational explorations of test anxiety can be closely linked to the process of construct validation" (p. 382). It was hoped that test anxiety research within the nursing education arena would assist in broadening the scope of understanding the construct of test anxiety and its relationship to academic achievement.

The age of nursing education students also has changed significantly with nontraditional students now outnumbering traditional students. The average age in 1991 for students enrolled in the same program used in this study was 31.07 years. Observation by some nursing educators have led to the belief that older students appear to frequently exhibit high levels of test anxiety and need some form of intervention that will assist them in reducing ~~this~~ anxiety.

It was hoped that findings acquired from this research can help nursing educators in their attempts to understand why many able students fail or exit nursing programs. If part of the problem is an inability to cope with their test anxieties, perhaps methods aimed at

reduction of this anxiety could be implemented with a follow-up comparison of TAI retest results. Techniques for assistance with test anxiety have and are being developed. Test anxiety reduction also may help students who graduate from nursing educational programs but suffer continuously with this problem throughout their education. These students may feel less inclined to continue advanced education if test anxiety is present. There are short and long term implications for these students regarding both future confidence and performance. Students with high levels of test anxiety may hesitate to undertake continuing education in both degree and non-degree educational programs. It was hoped that early intervention will benefit both students and nursing educational programs. It was also hoped that nursing education programs would review teaching and evaluation methodologies to maximize student success.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

The purpose of this study was to investigate the relationship among test anxiety, academic achievement, and age. This chapter is divided into three sections. The first section presents the conceptual basis for the study. Research relevant to test anxiety is discussed in the second section. A brief summary concludes the chapter.

#### Conceptual Framework

The conceptual foundation for this research was based on the concept of anxiety. S. B. Sarason (1960) believed anxiety has its roots in childhood and is manifested as a result of a combination of developmental and environmental factors. He defined anxiety as a need for security that remains unfulfilled. Sarason further contended that "the passage of time tends not to be therapeutic and the problem [anxiety] may remain at a particular level or become worse" (p. 22).

Anxiety as a concept relevant to nursing was developed by nurse theorist Hildegard E. Peplau (Peplau, 1952). Peplau viewed anxiety as a frequent consequence

of tension resulting from perceived needs. If the need is strong, "all behavior is directed toward it..." (p. 80). Peplau proposed that anxiety occurs in varying degrees or levels, ranging from mild anxiety to panic. She postulated that mild anxiety frequently heightens alertness and problem-solving ability. As anxiety increases, however, alertness and learning capability decline, and panic may ensue. Peplau further stated that "when needs are not met in direct ways, with subsequent lowering of tension, somatic, or physical responses of greater intensity than is usual are activated. These responses, being more closely related to emotional and psychosocial needs than to structural difficulties in the organism itself, are usually called psychosomatic responses" (p. 83). These types of responses described by Peplau were studied by other researchers investigating test anxiety. Whitley (1992) acknowledged Peplau as the pioneer in defining anxiety within nursing. Anxiety continues to be defined as both a psychological and physiological phenomenon.

According to I. G. Sarason (1978), anxiety is "a type of cognitive response marked by self-doubt, feelings of inadequacy, and self-blame" (p. 195). Similarly, Lazarus and Averill (1972) conceptually

defined anxiety as involving a "threat to the integrity of cognitive systems" (p. 278).

The term "test anxiety" did not appear in the literature with any frequency until the 1960s and 1970s. Test anxiety, as a related concept, was defined originally as it related to children by S. B. Sarason et al. (1960). They believed that "the test anxious child may have strong hostility toward parents and also strong guilt" resulting in self-depreciatory attitudes with anticipation of test failure (p. 19). The testing situation was thought to be an unpleasant experience that interfered with problem solving. They also concluded that the passage of time was unlikely to be therapeutic in reducing test anxiety and at best a static anxiety level would exist but more likely the anxiety would become worse.

Spielberger, Anton, and Bedell (1976) defined test anxiety in terms of personal disposition toward experiencing both intense personal state anxiety in testing situations and emission of "negative, self-centered, worry responses" (p. 341). The high level of these responses produce "task-related error tendencies" and "task-irrelevant worry responses," both of which decrease performance (p. 324). Test anxiety

also was defined by I. G. Sarason (1978). Sarason, an independent researcher and frequent coauthor with Spielberger, believed that when characteristics of a person's anxiety are linked to examination situations, the anxiety can be labeled test anxiety.

Initial systematic investigation of test anxiety was begun in the 1950s (S. B. Sarason, Mandler, and Craighill, 1952). Sarason et al. defined anxiety as a learned drive that operates as a strong stimulus. In testing situations, this anxiety produces two types of responses: (1) non-task relevant responses (feelings of inadequacy and wanting to leave the situation) and (2) task-relevant responses that allow completion of the task and reduce anxiety.

I. G. Sarason (1972) cited his earlier research in which an attempt was made to compare general anxiety with test anxiety. College students (not defined) were given a General Anxiety Scale and Test Anxiety Scale to complete. They then were asked to complete a serial learning task of dissyllable words. Half of the group was given only neutral instructions necessary to perform the task. The other half was told that the test was a measure of intelligence and the students were urged to do as well as possible. Although much of the specific

numerical data were not included, students with high and low general anxiety scores performed equally well. When test anxiety scores were compared, students with high test anxiety scored similarly or better than those with low test anxiety only in the neutral instruction group (69.7 and 63.4 respectively). In the intelligence achievement instruction group, high test anxiety students scored 52, while their low test anxiety counterparts scored 62. Statistical analysis to determine significance was not included. Sarason concluded that general anxiety and test anxiety are different from one another. He also supported the notion that test instructions and perceived importance of tests may alter examination performance in high test anxious students.

Test anxiety, according to Spielberger (1979), consists of two primary components: worry and emotionality. Worry includes personal thoughts regarding poor test performance and ultimate course or academic failure. Emotionality includes physiological components such as fear, panic, tension, and increased heart and respiration rates. Both worry and emotionality combine to potentially interfere with test performance in many situations.

Meichenbaum and Butler (1980) supported a similar conceptualization of test anxiety (worry and emotionality) and expanded on possible contributing factors such as the nature of the "internal dialogue" in the test anxious student (p. 189). They proposed that the internal dialogue in the test anxious person is self-oriented rather than task-oriented, negative in nature, and tends to be self-escalating. Additionally, this negative self-reference is reflective of general, embedded thoughts about self and the environment. Meichenbaum and Butler also acknowledged the importance of the meaning of the evaluative situation to the student and the various implications of failure that may greatly vary in perceived or real magnitude.

#### Review of Relevant Research

There are many variables that have been identified as useful in predicting academic achievement (Chacko and Huba, 1991; Howell and Swanson, 1989; Watson, 1988). Test anxiety has been frequently researched as one of these variables and appears to play a powerful role in academic achievement.

An early investigation conducted by S. B. Sarason (1960) focused on children and test anxiety. He



surmised that the test anxious child may have a severe sense of guilt along with hostility toward parents. In testing situations, the child manifests self-depreciatory attitudes, anticipates test failure, and experiences the situation as unpleasant with resultant interference with problem solving. These feelings are thought to persist into adulthood. Sarason developed both test and general anxiety scales for children. His research studies yielded a variety of results, but overall conclusions indicated that a time criterion and no additional trials had detrimental effects on high anxiety students.

Similar research was conducted by I. G. Sarason (1978). He compiled the examination scores of 34 undergraduate students enrolled in a personality class. Using a Test Anxiety Scale developed by Sarason, high and low anxiety students were identified and their examination scores compared. Average scores were 32.06 and 30.93 respectively. He then informed all students that they would be given a second examination over the same material and if they got a higher score, it would be entered in the grade book, but they would not be penalized if the score was lower. Second test results for high and low anxiety students were 42 and 33.73

respectively. These results were statistically significant at the 0.05 level, although specific values were not identified. "There was a marked facilitative effect of the no-risk condition for students relatively high in anxiety" (I. G. Sarason, 1978, p. 213).

Spielberger (1966; 1979) also investigated adult test anxiety in a systematic manner. In 1966, Spielberger conducted studies in which he selected 24 high anxiety students and 24 low anxiety students enrolled in introductory psychology courses at Duke University and the University of North Carolina. Anxiety was determined using scores on the Taylor Manifest Anxiety Scale. Spielberger discovered that in testing situations, the high anxiety group demonstrated overall poorer performance as task difficulty increased.

Spielberger et al. (1976) applied their premise of a worry and emotionality component in test anxiety. Although specific data were not included, they related research results that suggested that worry about tests remains constant in high anxiety students, but emotionality increases immediately prior to the testing situation. This finding was supported by Deffenbacher (1980) who cited five studies involving college students ( $N = 77-87$ ). In each study, worry correlations were

significantly inversely related to performance (  $-.26$  to  $-.36$ ,  $p = .01-.001$ ), while emotionality correlations were not always significant (  $-.07$  to  $-.26$ ,  $p = .10-.01$ ).

Deffenbacher believed the timing of emotionality measurements is a critical factor. Emotionality may peak just prior to an examination and decrease during the examination as greater attention is focused on the examination. He therefore supported the notion that the worry component of test anxiety acts as a more pervasive factor with performance than emotionality.

A later study conducted by Spielberger (1979) investigated anxiety and overall semester grade point average. Participants were 140 high anxiety and 144 low anxiety students enrolled in introductory psychology classes at Duke University. Scholastic aptitude for these students was determined using the ACE Psychological Examination. Students were then placed in groups depending on their scholastic aptitude. The ACE scores for groups I-V ranged from 62-102, 103-116, 117-126, 127-137, and 138-174 respectively. Graphic depiction of these results demonstrated a trend in which the 3 middle scholastic aptitude groups with high anxiety had lower grade point averages for the semester than their low anxiety counterparts. Statistical

significance was not reported. In addition, the ultimate failure/drop-out rate for the same high anxiety students was 20% as compared to 6% for the same low anxiety students.

Kirkland and Hollandsworth (1980) reported statistically significant correlations between test anxiety and GPA ( $r = -.37$ ,  $p > .001$ ) and ACT scores ( $r = -.31$ ,  $p > .001$ ). The subjects consisted of 305 undergraduate students enrolled in introductory psychology and sociology courses at a Southeastern university.

The literature related to test anxiety also contained numerous studies that have investigated specific factors that may contribute to test anxiety. These include cognitive interference, study skills, test taking skills, types of testing instructions, and previous academic success. Bruch, Pearl, and Giordano (1986) investigated the effects of several variables of test anxiety on academic performance. These included information-processing strategies, degree of belief in negative self-statements, type A behavior, test-taking skills, and unrealistic expectations. The sample consisted of 58 undergraduates at an unnamed institution. The ages of the students ranged from 18 to

25 years. MANOVA findings included statistically significant effects of test anxiety ( $F = 3.03, p \leq .05$ ) on performance ( $F = 8.27, p < .001$ ). Also, ANOVA results for test-taking skills were statistically significant for performance ( $F = 35.27, p < .001$ ) regardless of anxiety levels. Bruch et al. concluded that deficits in academic skills, particularly test-taking skills, may be more important determinants of performance than worry or emotionality.

Similar results were reported by Brown and Nelson (1983). Their research involved 72 undergraduate students enrolled in an Introduction to Applied Psychology class at a large midwestern state university. The high performers in this group reported greater cognitive control ( $F = 12.97, p = .001$ ) regardless of anxiety levels. Thus they supported focusing on cognitive control as one mechanism to improve performance.

I. G. Sarason and Stoops (1978) proposed that test anxiety is affected by cognitive interference (preoccupation) that then affects performance. Their subjects included 96 psychology students from the University of Washington. All students were given the Test Anxiety Scale to determine level of test anxiety.

One half of the group was given achievement-oriented instructions. The other half was given neutral instructions. All students were then asked to complete a digit symbol task. An ANOVA revealed a statistically significant interaction among test anxiety, conditions (type of instruction) ( $F = 3.73, p < .10$ ) and performance ( $F = 4.07, p < .05$ ). Highly test anxious students performed more poorly when given achievement-oriented instructions.

Naveh-Benjamin and Lin (1987) proposed that it is the testing situation, rather than study habits, that has a more profound effect on performance. The subjects included 86 students enrolled in a research methodology course at Ben-Gurion University. Proficient study skills for high anxiety students were reported to have a beneficial effect in non-evaluative situations, but no significant benefit in evaluative (examination) situations. Poor study skills for high anxiety students produced poor performance results for both situations ( $F = 4.3, p < .05$ ). Naveh-Benjamin and Lin proposed that there are two types of test anxious students. One group requires assistance in the testing situation only, and the other requires assistance in both study and test-taking skills.

In an anecdotal article, Casanova (1988) suggested that faculty members also should identify their own test anxiety. She identified that the demands for better test results may contribute to faculty anxiety that is subsequently transmitted to students.

Hunsley (1985) investigated the correlations of several variables of test anxiety over the course of a semester. The subjects consisted of 62 undergraduate students enrolled in a statistics course whose test anxiety was measured during each of 4 examinations that were administered throughout the semester. Variables were most strongly correlated with test anxiety at the beginning of the term. For example, positive cognitions were  $-.21$  ( $p < .05$ ), and negative cognitions were  $.48$  ( $p < .01$ ). This compares to  $-.04$  and  $.19$  respectively at the end of the term. Self-efficacy and predicted grade (not defined) were strongly correlated with test anxiety at both the beginning and end of the semester ( $-.26$ ,  $-.31$ ,  $p < .05$  and  $-.35$ ,  $-.26$ ,  $p < .05$  respectively). All correlations were weaker during the middle of the semester except for actual performance. These were significant for examinations 1, 3, and 4 ( $r = -.29$ ,  $-.30$ ,  $-.33$ ,  $p < .05$ ). The authors reported that there are situational differences at different

times of the term. For example, the first examination may be perceived with greater uncertainty of content. By the last examination, poorer performance has been confirmed for many test-anxious students, validating a reason for these students to question their ability.

The Test Anxiety Inventory (TAI) (Spielberger et al., 1980) was developed to specifically analyze test anxiety components in a research setting. Spielberger compared TAI scores for 195 male navy recruits and 72 female navy recruits with scores on recruit training examinations. Negative correlation results of -0.34 and -0.19 respectively were obtained between TAI scores and examination results. Spielberger concluded that test anxiety has a negative effect on academic achievement.

There are numerous studies supporting Spielberger's original research, but in nursing education no research was discovered that specifically investigated test anxiety and academic achievement. A related study by Poorman and Martin (1991) included test anxiety as one possible variable predictive of success on the NCLEX. Participants were 102 female, second semester, senior-level baccalaureate nursing students, who were 25 years old or less, and eligible to sit for the NCLEX on graduation. Each participant completed the TAI prior to



taking the NCLEX. Application of a Pearson's product moment correlation coefficient demonstrated a statistically significant inverse relationship between the passing score on NCLEX and test anxiety ( $r = -0.31$ ). Application of a  $t$  test revealed a significant difference in TAI scores ( $t = 3.55$ ,  $p < 0.05$ ) between the group that passed the NCLEX ( $N=92$ ) and the group that failed the NCLEX ( $N=10$ ).

Beck and Srivastava (1991) conducted a descriptive study to investigate perceived level and sources of stress in 94 Bachelor of Science in Nursing (B.S.N) students enrolled at the University of Newfoundland. Stress of taking examinations ranked second (85%) only to long hours of study (92%).

Two literature searches yielded no nursing educational studies specifically targeted at test anxiety, academic performance, and age, or any combination of these variables. Some research studies on test anxiety and academic performance occasionally mentioned age but did so incidentally and did not include age as a variable. It was interesting to note, however, that the majority of studies that did mention age researched students in their early twenties.

Research by Highfield (1988) investigated learning

styles of baccalaureate nursing students and included age as a variable. No statistically significant differences, however, were found between learning styles and age of students.

Mattson (1990) investigated coping strategies of 138 B.S.N. students at a Southern California state university. Ages of the students ranged from 23 to 62 years. Coping effectiveness in the nursing program was found to be statistically significantly related to previous successful coping ( $t = 3.281$ ,  $p = 0.05$ ) and developmental maturity ( $t = 2.560$ ,  $p = 0.05$ ) There was no statistically significant relationship between age of student and coping efficiency. The author supported the contention that people mature at different rates throughout adulthood.

A study by Lindop (1990) provided data on nursing students in age categories closely paralleling the age groups utilized for this research. Lindop's subjects consisted of 324 nursing students (no level given) enrolled in the North Staffordshire College of Nursing and Midwifery in the United Kingdom. Using a self-developed questionnaire, Lindop in part evaluated student attitudes about various aspects of the nursing program among different age groups. One finding was

that the students frequently reported feelings of pressure. Students with ages ranging from 17-25 and 26-35 expressed the strongest feelings of general pressure, and students with ages ranging from 36-45, the least (there was an older group) ( $F = 5.1, p = 0.00$ ). Within the educational environment, students with ages ranging from 17-25 and 36-45 expressed the greatest stress, with examinations cited as a stressful situation (no data listed). A sense of determination was greatest for students aged 36-45, then 26-35, and weakest for students aged 17-25 ( $F = 3.7, p = 0.01$ ). Similar results were obtained for "the need to carry on" and "the need to finish something I started" (Lindop, 1990, p. 114). Results, therefore, supported a significantly greater perceived need for effort on the part of older students.

Spielberger (1979) suggested some aspects of aging that may contribute to stress and anxiety. These include a decline in physical capacity, decreased job mobility, fewer opportunities, and approaching age of retirement.

The literature on adult education provided information that may support the notion that older students experience higher anxiety. Knowles (1980)

integrated the ideas of several theorists in interpreting adult needs and their relationship to education. Overall, he proposed that the need for self-fulfillment and a sense of worth comprise significant motivation for adults to continue their education. Education received in their youth may have been inadequate or obsolete for current utilization in the job market. "An educational need, therefore, is the discrepancy between what individuals....want themselves to be and what they are; the distance between an application and a reality" (p. 88). Older adults may believe that time to fulfill educational needs is limited and perceive greater pressure to fulfill them quickly and successfully. Knowles also concluded that a time does come when some adults believe that their time for these aspirations is over.

Age and learning ability also have been a focus in adult education literature. Lumsden (1985) identified that there is evidence that there may be learning deficits that occur gradually as learners get older. He cited declines in paired associate and serial learning task performance, but was not specific with regard to the age at which these deficits begin to appear. Knowles (1980) also supported a decline in learning

capacity and concluded this decline to be approximately one percent a year after age twenty, but proposed that the decline is related to speed of learning and not intellectual power. Knowles also cited several other factors that if present could impede adult learning. These included adults who have not been involved in systematic education for a long period of time and lack confidence or situations in which physiological decline is occurring.

#### Summary

Anxiety served as the conceptual basis for this study. Anxiety is a feeling of insecurity, inadequacy, and the result of unmet needs. When these feelings exist in examination situations, test anxiety is present.

The literature overwhelmingly supports an inverse relationship between test anxiety and academic achievement, but this research has been investigated infrequently in nursing education. In all educational arenas, there is a great deal of contradictory or inconclusive evidence with regard to which variables contribute to test anxiety and to what degree they do so. No research could be found to support that age may

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be a contributing variable, although related data indicated possible increases in perceived stress as a person ages. There is a need, therefore, for nurse educators to investigate the relationship among test anxiety, academic achievement, and age in nursing students.

## CHAPTER THREE

## METHODOLOGY

The purpose of this study was to investigate the relationship among test anxiety, academic achievement, and age in ADN students. This chapter focuses on the research methodology used for the study and includes the following sections: the research design, sample and sampling plan, the data collection instrument, data collection procedures, and the protection of human subjects.

## Research Design

The design of this study was descriptive in nature with the intent to answer the following question: Is there a relationship among test anxiety, academic achievement, and age? Specifically, the relationship between academic achievement and test anxiety in nursing students was investigated and described. In addition, this study examined a possible relationship between test anxiety and age. A descriptive approach examines phenomena as they occur. It is the initial data about a topic that are gathered, analyzed and forms the basis for further research. Test anxiety and academic

achievement, although widely studied, have not been investigated in nursing education. Studies exploring test anxiety and age were not evident in the literature. Therefore, studies that describe relationships among these three variables are needed.

#### Sample and Sampling Plan

The sample consisted of 107 second year, first semester full-time ADN students. These students were all enrolled in the same midwest nursing program, but located on two campuses, one rural and one predominantly urban. Forty-six students were from the rural campus and sixty-one students were from the urban campus.

A convenience sampling plan was utilized during regular nursing class hours on each campus. This is the next to last nursing course prior to completion of the program, and consists of medical-surgical, obstetric, and mental health content. Students on both campuses attend identical nursing classes. All students had taken nursing classes previously within the same nursing program but they were not all in the same classes or the same campus. A total of 107 students enrolled in the midwest nursing program and in attendance at the above classes were invited to participate in the study. All



attending students agreed to participate.

#### Data Collection Instrument

The Test Anxiety Inventory (TAI) (Spielberger et al., 1980), a tool that measures individual differences in test anxiety, was used to measure test anxiety (Appendix A). The TAI is a 20-item paper and pencil test that takes 5-10 minutes to administer and measures two major components of test anxiety: worry and emotionality. The tool requires participants to report how frequently they experience specific anxiety symptoms in test-taking situations. Each item on the tool has a possible score of one (least anxious) to four (most anxious). An example of a statement on the TAI is "During examinations I get so nervous that I forget facts I really know." The scores for the items are combined for a total composite score ranging from 20 (lowest test anxiety) to 80 (highest test anxiety).

Within the TAI total score, worry or emotionality subscores also can be compiled. Eight statements comprise the worry component with scores ranging from a minimum total of 8 to a maximum of 32 for each. An example of a worry statement from the TAI is "Thinking about my grade in a course interferes with my work on

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tests." Eight statements comprise the emotionality component, with scores ranging from a minimum total of 8 to a maximum of 32 for each. An example of an emotionality statement from the TAI is "While taking examinations I have an uneasy, upset feeling."

The validity of the TAI was established using correlations with six other anxiety measures and 4 measures of personality (Spielberger et al., 1980). The anxiety measures used were the Test Anxiety Scale, the Worry and Emotionality Questionnaire, the State-Trait Anxiety Inventory (Anxiety Trait and Anxiety State scales), and the Exam Anxiety Scale. The personality measures used were The State-Trait Anxiety Inventory (Anxiety Trait), the State-Trait Curiosity Inventory (Curiosity Trait), the Locus of Control Scale, and the Irrational Personality Trait Inventory. The validity correlations were highest with the anxiety measures (0.34 - 0.86). The Test Anxiety Scale produced correlations of 0.82 and 0.83 for males and females respectively and the Exam A-State had correlations of 0.86 and 0.77 for males and females respectively. "The high correlations of the TAI total scale with the scores from the administration of the STAI A-State... demonstrate the construct validity of the TAI Total as a

measure of individual differences in anxiety proneness in test situations" (pp. 5-6). Personality test correlations were lower and ranged from -0.23 to 0.58.

TAI test-retest reliability for college students after three weeks was .80 (Spielberger et al., 1980). The alpha coefficients for five normative samples ranged from .92 to .96. In the community college setting, the alpha coefficients were .93 and .96 for males and females respectively.

#### Data Collection Procedures

Data collection procedures were completed by the researcher. During the eighth week of a fourteen week semester, the consent forms and TAI were distributed. Although a 5 to 10 minute time frame was recommended, 20 minutes were allotted for completion and collection of the TAI at the end of a regular nursing class. The tool was administered on two consecutive days, one on each campus, and was completed by the student participants seven days prior to the fourth out of six scheduled unit examinations for the rural campus group and six days prior to the fourth scheduled unit examination for the urban campus group. This time frame was used to minimize any unintentional effects of the TAI on course

examination performance. The researcher verbally explained the study to the students, invited each student eligible to participate in the study, and requested that students who desired to participate sign a consent form (Appendix B). The consent form cover letter explained participation, confidentiality, risks, benefits, and how each participant could obtain results of the study. The student participants were asked to complete the TAI, write their age in years on the consent form, and release their final course grade to the researcher. The signed consent forms were collected by the researcher.

Immediately after collecting the signed consent forms, the TAI was administered. No time limit for completion was imposed and all participants completed the TAI before the end of the scheduled class (within 15 minutes). These results were retained by the researcher and kept in a locked file until data collection was completed. At the end of the semester, student final course grades were obtained from a faculty member and listed with the TAI results and age for each participant. When course grades were matched with anxiety scores and ages, the list of names associated with each set of scores was destroyed to protect student

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confidentiality.

#### Protection of Human Subjects

Special consideration was given to the protection of the rights of the student subjects. Permission to conduct the study was obtained from the Human Subjects Research Review Committee (HSRRC) at Drake University (Appendix C). Agency approval for the study and permission to collect data during regular class time then was obtained from the Program Director of Nursing and the Dean for the program (Appendix C). Students were informed that their participation was entirely voluntary. A cover letter was developed that explained to the students participation, confidentiality, risks, benefits, and how each participant could obtain results of the study (Appendix B). Informed consent also was obtained (Appendix B). The TAI was administered 6 or 7 days prior to the next scheduled examination in an attempt to minimize any effect on examination scores.

#### Summary

To investigate the relationship among test anxiety, academic achievement and age, the TAI was administered to 107 second year, first term ADN students, and TAI scores were compared with final course grades and ages.

The results of the data are presented and analyzed in Chapter Four.

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## CHAPTER FOUR

### ANALYSIS OF DATA

The purpose of this study was to investigate the relationship among test anxiety, academic achievement, and age. This chapter is divided into five sections. Descriptive data related to sample characteristics are presented in the first section. The second and third sections discuss and analyze data related to the two research hypotheses. The fourth section presents incidental findings related to the study. A summary concludes the chapter.

#### Characteristics of the Sample

The sample consisted of 107 first term, second year ADN students. Forty-six of the students were enrolled at the rural campus of the community college, and sixty-one of the students were enrolled at the urban campus. The sample was predominantly female, with 88 percent female and 12 percent male. As indicated in Table 1, the ages of participants ranged from 19 to 54 years and were divided into three age groups. Group one included participants age 19 to 25 years (20 %). Group two included participants age 26 to 34 years (49 %), and

group three included participants age 35 years and older (31 %).

Table 1

Characteristics of the Sample

Trait	Urban Campus	Rural Campus	Total
<u>Sex</u>			
Female	N = 52 (85%)	N = 42 (91%)	N = 94 (88%)
Male	N = 9 (15%)	N = 4 (9%)	N = 13 (12%)
Total*	N = 61 (57%)	N = 46 (43%)	N = 107 (100%)
<u>Age</u>			
Group 1 (19-25)	N = 12 (20%)	N = 9 (19%)	N = 21 (20%)
Group 2 (26-34)	N = 26 (42%)	N = 27 (59%)	N = 53 (49%)
Group 3 (35 & >)	N = 23 (38%)	N = 10 (22%)	N = 33 (31%)
Total*	N = 61 (57%)	N = 46 (43%)	N = 107 (100%)

\* Represents component of total sample

Hypothesis One

The first research hypothesis was: There will be a significant inverse relationship between test anxiety



and academic achievement in second year, first term ADN students. The TAI was administered to determine test anxiety levels for each participant. As indicated previously, TAI scores can range from a low of 20 (low test anxiety) to a high of 80 (high test anxiety). The TAI scores for the total sample ranged from 20 to 75 with a mean average of 42.748 and a standard deviation of 14.999. Age group 1 (19 to 25 years) had a mean TAI average of 40.476, with a standard deviation of 15.686. Age group 2 (26 to 34 years) had a mean TAI average of 43.887, with a standard deviation of 14.257. Age group 3 (35 years and older) had a mean TAI average of 42.364, with a standard deviation of 15.994.

Course total grades in percentages also were obtained for each participant. Course grades ranged from 44.72% to 97.04%, with a mean average course grade of 81.26% and a standard deviation of 0.070. Age group 1 (19 to 25 years) had a mean course grade average of 78.94%, with a standard deviation of 0.064. Age group 2 (26 to 34 years) had a mean course grade average of 81.78%, with a standard deviation of 0.055. Age group 3 (35 years and older) had a mean course grade average of 81.92%, with a standard deviation of 0.016.

A Pearson product moment correlation coefficient

was applied to measure hypothesis one. The alpha level was set at 0.05. A significant inverse relationship was found ( $r = -0.306$ ). Hypothesis one was supported. As test anxiety increased, students' academic performance decreased.

#### Hypothesis Two

The second research hypothesis for the study was: There will be no significant difference in test anxiety among second year, first term ADN students according to age. The total student sample was divided into three age groups. Group one consisted of participants whose ages ranged from 19 to 25 years. Group two consisted of participants 26 to 34 years, and group three consisted of participants 35 years and older. TAI scores for each age group were reported in the previous section. An Analysis of Variance comparing the three age groups with their TAI scores was applied (Table 2). The degree of significance was set at 0.05. The F ratio was calculated and compared with variance points to determine significance of values ( $F (2, 104) = 0.400$ ).

Table 2

Analysis of Variance of TAI scores with Age Groups of  
ADN Nursing Students

Source of variance	df	Sum of squares	mean square	F Ratio	p level
Within groups	2	181.992	90.996	0.400	0.671
Between groups	104	23666.195	227.560		

When the Analysis of Variance was applied, there was no statistically significant difference in test anxiety among the three age groups of students ( $p = .671$ ). Thus, the hypothesis of no significant difference in test anxiety in ADN students according to age was supported.

#### Incidental Findings

Other data were analyzed to provide additional information related to the study. Although the data were not directly related to the purpose of this study, they may provide insight for future research studies.

Within the total TAI score, worry or emotionality

subscores also can be compiled. Eight statements comprise the worry component and each has a possible value of 1 to 4 points. Total worry scores can range from 8 (low worry) to 32 (high worry). Eight statements comprise the emotionality component and each has a possible value of 1 to 4 points. Total emotionality scores can range from 8 (low emotionality) to 32 (high emotionality). Worry scores of the student sample ranged from 8 to 30, with a mean average score of 15.16 and a standard deviation of 5.7339. Emotionality scores of the student sample ranged from 8 to 32, with a mean average score of 18.2804 and a standard deviation of 6.6797.

A Pearson product moment correlation coefficient was applied to compare (1) worry components of the TAI score with course grades; (2) emotion components of the TAI score with course grades; and (3) worry TAI scores with emotion TAI scores. When the Pearson  $r$  was applied, the total TAI worry scores and course grades were found to have an inverse relationship ( $r = -0.3871$ ), indicating that as the worry component of test anxiety increased in students, academic achievement decreased. The total TAI emotionality scores and course grades were found to have a weaker inverse relationship

( $r = -0.1890$ ), indicating that as the worry component of test anxiety increased, academic achievement decreased. The total TAI worry and TAI emotion scores were found to have a strong positive correlation with each other ( $r = 0.7921$ ). As the worry component of test anxiety increased, the emotion component of test anxiety also increased in the students.

An Analysis of Variance was applied to measure the differences among (1) age groups and course grade; (2) age groups and TAI worry scores; and (3) age groups and TAI emotion scores ( $p = 0.05$ ). Tables 3, 4, and 5 list statistical data for the Analysis of Variance of each.

Table 3

Analysis of Variance of Course Grades with Age Groups of ADN Students

Source of variance	df	Sum of squares	mean square	F Ratio	P level
Within groups	2	0.0143	0.0072	1.4620	0.2365
Between groups	104	0.5095	0.0049		

No significant difference was found in the course grades of the students according to age ( $p = 0.2365$ ).

Table 4

Analysis of Variance of TAI Emotion Scores with Age Groups of ADN Students

Source of variance	<u>df</u>	Sum of squares	mean square	F Ratio	<u>p</u> level
Within groups	2	4.6403	2.3202	0.0693	0.9331
Between groups	104	3480.3316	33.4647		

No significant difference was found in the TAI emotion scores of the students according to age ( $p = 0.9331$ ).

Table 5

Analysis of Variance of TAI Worry Scores with Age Groups of ADN Students

Source of variance	df	Sum of squares	mean square	F Ratio	P level
Within groups	2	59.5494	29.7747	0.6631	0.5174
Between groups	104	4670.0394	44.9042		

No significant difference was found in the TAI worry scores of the students according to age ( $p = 0.5174$ ).

#### Summary

To investigate the relationship among test anxiety, academic achievement and age in first term, second year ADN students, two hypotheses were tested. A significant inverse relationship ( $r = -0.306$ ) was found between test anxiety and academic achievement ( $p < 0.05$ ). No significant difference, however, was found between test

anxiety and age of students ( $F = 0.400$ ,  $p = 0.671$ ).

Incidental findings revealed an inverse relationship between course grade and TAI worry scores ( $r = -0.3871$ ) and course grade and TAI emotion scores ( $r = -0.1890$ ) among the ADN students. TAI worry scores and TAI emotion scores had a positive relationship ( $r = .7921$ ). No significant differences were found among age groups and course grade, age groups and TAI emotion scores, or age groups and TAI worry scores among the ADN students.



## CHAPTER FIVE

### SUMMARY, DISCUSSION AND RECOMMENDATIONS

#### Summary

The purpose of this study was to examine the relationship among test anxiety, academic achievement and age in Associate Degree Nursing students. To test the relationship among the variables, two hypotheses were posed. Employing a descriptive research design, data were collected through the TAI (Spielberger, et al., 1980) and compared to the final course grades and ages of 107 first term, second year ADN students.

Data were analyzed by the use of descriptive statistics, the Pearson product moment correlation coefficient, and the ANOVA. The alpha level was set at 0.05. The results revealed that as test anxiety increased, academic achievement (course grade) of the ADN students significantly decreased ( $r = -0.31$ ,  $p < .05$ ). No significant relationship between age and test anxiety in the ADN students was found ( $p = 0.635$ ).

#### Discussion

The first hypothesis stated that there would be an inverse relationship between test anxiety and academic

achievement. The findings of this study supported this hypothesis that as test anxiety increased, ADN students' academic performance (course grade) decreased. This finding supports Peplau's (1952) proposition that increased anxiety leads to decreased alertness and learning capability. This study also corroborates the previous research conducted by Kirkland and Hollandsworth, 1980; Naveh-Benjamin and Lin, 1987; I. G. Sarason, 1972; Spielberger, 1966; 1979. In each of these studies, as anxiety increased, academic performance significantly decreased.

A combination of influences may have affected the results of this study. S. B. Sarason (1960) proposed that a time criterion or no additional trials in testing situations had a detrimental effect on highly test anxious students. The students used in this study were enrolled in a program in which both a time criterion and no additional trials are in effect for examination situations. Students are allotted one hour to answer approximately 60 examination questions. Students also are not permitted to retake any examinations. These factors may have influenced the findings of this study by producing higher test anxiety in the students. The TAI, however, was given prior to the fourth exam (out of

six), near midterm of the semester. Hunsley (1985) found weaker correlations of test anxiety and academic performance during this approximate period. He proposed that test anxiety is lower at this time because students have already experienced an examination situation, and final course grading is not imminent. Administering the TAI for this study near midterm may have lowered correlational results because both timing situations were present.

The second hypothesis proposed that no relationship between age of students and level of test anxiety would be found. ANOVA results indicated that the age of students was not related to the level of test anxiety ( $p = 0.671$ ) in this study. Lindop (1990) reported that some older students verbalize more feelings of pressure and stress than younger students. This lent support to this researcher's notion that older students would manifest higher test anxiety levels. It is possible, however, that age groupings for the students in this study were too broad. Lindop used a fourth, older group of students for her research and reported that the older group did not verbalize significantly higher levels of pressure and stress. Other possible explanations for the lack of significant findings regarding age and test

anxiety in the nursing students could be the result of the tool used for this research. The TAI may not be sensitive to age. Older students may face stressors that are not adequately assessed and measured in the TAI, but contribute to test anxiety. Finally, it is possible that older students are more verbal about test anxiety but do not actually experience higher anxiety levels than younger students.

Additional findings of the study included the finding that the ADN students experienced stronger TAI worry components than the TAI emotionality components when compared with academic achievement. The TAI was given 6 and 7 days prior to the next scheduled course examination. Deffenbacher (1972) proposed that the worry component of test anxiety remains relatively stable while the emotionality component is strongest near the time of an examination. In this study, the emotionality coefficient obtained several days prior to the next scheduled examination was lower than the worry coefficient, and therefore supports Deffenbacher's notion of lower emotionality when an examination is not imminent. The scores may have been higher if the TAI had been administered just prior to an examination.

### Limitations

There are limitations of any study that explores complex variables among human beings. Several of these are discussed as they pertain to this study.

The first major limitation of the study was related to the sample. The sample was not large, not randomly selected, and not necessarily representative of ADN students, or any other nursing student. Therefore, the generalizability of the findings from the study are extremely limited. All students were enrolled in the same class with the same educational curriculum. There was a different group of faculty at each of the urban and rural campuses, but all components of the educational program were the same. If other ADN programs had been used, results may have been different for reasons such as curriculum design. In addition, because registered nurse preparation may be accomplished by 3 different educational programs (ADN, Baccalaureate, and Diploma), research that includes nursing students from each of these settings may provide more comprehensive and accurate findings regarding test anxiety in nursing students.

A second major limitation was the timing of the administration of the TAI. Because the TAI was given 6

and 7 days prior to the fourth unit examination, total TAI scores may have been lower. According to Deffenbacher (1972), emotionality increases only at the time of an examination. At the time the TAI was given for this study, TAI emotionality scores may have been decreased from their expected peak nearer to an examination. Also, the TAI was given during the last 15 minutes of a scheduled class. Participants knew they could leave as soon as they finished. Although no time limit for completion of the TAI was imposed and the manual states that 5 to 10 minutes is sufficient for completion, students may have hurried to finish and given less thought to accuracy. Therefore, TAI results for this study might not reflect accurately the students' perceptions of test anxiety.

A third major limitation of this study was the age grouping techniques used to compare the level of test anxiety with age. All students were combined into only three age groups. The age groups of the two groups of younger students was 7 and 9 years respectively, but the older group's age had a range of 19 years. Specific comparison of these older students or even a fourth older group might have yielded different findings in levels of test anxiety.

Other factors also may have threatened the validity of this study. The TAI may not accurately reflect test anxiety for older students. Validity and reliability testing completed by Spielberger (Spielberger et al., 1980) used scores primarily obtained from participants who were young adults. Scores from older participants may have yielded different results. Spielberger et al. also did not test the TAI with a female population drawn from a large sample. Navy recruits were used for this purpose, and traditionally the male population is significantly higher. Validity and reliability results for the TAI might have been different if the sample of female participants had been larger. In addition, as reported previously, when the TAI was compared with the Exam A-State for validity, the correlation coefficient was lower for female participants than male participants (0.77 and 0.86) respectively. In this study 88% of the nursing student participants were female.

Finally, the Hawthorne effect may have been a limitation in this study for several reasons. Students knew the TAI was measuring test anxiety and may have marked statements lower in an attempt to conceal their test anxiety and present themselves in what they believed to be a more favorable position. The students

also knew that the researcher was a faculty member of the program in which they were enrolled. They may have scored some statements higher in an attempt to please the researcher or to demonstrate an area of perceived need higher than its actual levels. In addition, the students' knowledge of involvement in a study may have influenced their responses.

#### Recommendations

Although this study has contributed to the body of knowledge regarding the relationship among test anxiety, academic achievement and age in nursing students, many questions remain unanswered. The following recommendations for future research are based on the findings of this study.

This study needs to be replicated with larger, randomly selected samples of nursing students from different programs (BSN, Diploma, ADN). In addition, the study should be replicated with different age groups of nursing students or each age should be evaluated specifically. Hypotheses regarding an age relationship with test anxiety may then be directed more specifically toward older nursing students in their forties and fifties.



Test anxiety and academic performance among nursing education programs that grade by examination only should be compared with nursing education programs that assess academic performance with other evaluation methods such as clinical performance, written assignments, projects, formal papers, group projects care plans, and class presentations. A hypothesis such as students with only examination scores for grading purposes will manifest higher test anxiety than students graded by a variety of evaluation methods could be researched.

Research should be conducted in which the TAI is administered closer to an examination and earlier in the semester. Hunsley (1985) reported higher levels of test anxiety at the beginning of a course than during the middle of the same course. Deffenbacher (1972) obtained higher emotionality scores at the time of an examination. This change in the timing of administration of the TAI may help to explore peak levels of test anxiety.

Another research study might consider comparing test anxiety scores with aptitude scores of nursing students. Spielberger (1979) reported higher levels of test anxiety for students with average aptitude scores

than those with high aptitude scores.

Nurse educators also might administer the TAI in a test-retest situation after test anxiety reduction interventions such as relaxation or test-taking skills courses have been implemented with students. The TAI also could be administered in a test-retest situation after faculty education in test construction, test anxiety self-awareness or other staff development programs to address faculty's influence on student test anxiety.

Finally, nurse educators need to further investigate the types of variables that contribute to test anxiety in nursing students and the degree to which they do so. These variables could include study skills, coping mechanisms, or internal cognitions.

#### Implications for Advanced Nursing

This study investigated a possible relationship among test anxiety, academic achievement and age in ADN students. I. G. Sarason (1972) believed that correlational studies are necessary for construct validation. Because no research exploring test anxiety, academic achievement and age was evident in the nursing education literature, this study was implemented. It has

added to the body of knowledge regarding test anxiety in nursing education by implicating test anxiety as a factor that may impede academic achievement of nursing students. Many capable nursing students may perform poorly because of its influence. Some nursing students may fail or exit nursing education. Others may hesitate to continue their education because of the effect of test anxiety.

Several implications are evident regarding test anxiety assessment and reduction in nursing education. First, nursing programs should assess for test anxiety early in the first course of a nursing program and preferably at times when anxiety is likely to be at its highest such as at the start of a course and near an examination time. The TAI used for this study is neither lengthy nor time consuming to administer and could easily be administered by nursing faculty members, counselors, or other qualified personnel.

After test anxiety levels for each student are determined, several test anxiety reduction methods should be investigated by nursing educators or counselors who meet with students individually, assist them in determining their needs, and refer them for assistance if needed. Many institutions now offer

programs which could assist some students in test anxiety reduction. These programs are usually directed at study and test taking skills acquisition. Acquisition of relaxation techniques is another approach and this could be learned through reading literature or perhaps audio tapes available at the library.

As indicated above, several methods of test anxiety reduction have been thoroughly developed and could be used by nursing educators or counselors in reducing the test anxiety of nursing students. One of the most frequently utilized strategies for reducing test anxiety is test-taking skills acquisition (Kirkland and Hollandsworth, 1980). In their research, this method was found to be superior to anxiety reduction techniques, another frequently used approach. Test-taking skills emphasize methods of reading all aspects of examination questions carefully to improve the selection of the correct answer. Tryon (1983) and Dendato and Diener (1986) reported that a combination of relaxation and study skills training was more effective than either technique used alone in reducing test anxiety. Other methods focus on educators' use of examination strategies and test construction methods to improve student performance (Barger, 1983; Fulkerson and

Martin, 1981; Plake, Ansorge, Parker, and Lowry, 1982). These methods include simple strategies from organization of examination content to more complex endeavors such as reliability and validity testing and item analysis.

More complex methods of test anxiety reduction have and are currently being researched. While these methods may not be readily accessible to nursing educators, they may be available, through referral, to nursing students with more complex test anxiety needs. Tryon (1983) found that methods directed at the worry components of test anxiety had a more beneficial effect on performance than treatment of emotionality components. The most effective single worry reduction method used by Tryon was cognitive procedures. This method teaches the student how to focus on the task at hand (the examination) rather than focusing on interfering self-oriented negative thoughts. Newer test anxiety reduction methods include modeling approaches (Rosenthal, 1980) and self-control approaches (Denney, 1980). In modeling approaches, the student observes, through live or video demonstration, the desired actions and responses during examination situations. Self-control approaches carry treatment beyond

relaxation techniques into rehearsal of examination situations and recognition of cues to promote relaxation.

Students who complete one or more of the basic test anxiety reduction programs should have test anxiety reassessed to evaluate improvement. If improvement is not evident, the student may have more complex needs which could possibly be met through referral to student assistance counseling programs or other resources outside of the institution.

Nursing educators employed in any setting such as formal nursing education programs, hospital-based certification programs, staff development programs, or continuing education workshops could assist students in reducing test anxiety by analyzing their own test anxiety. Educators may feel pressure for their students to perform well and meet the outcome criteria for which they are responsible. They also may experience personal test anxiety. Transmission of this anxiety to students can only serve to heighten that of students.

Nursing educators can participate in test construction workshops to ensure that examinations are valid, reliable, and organized effectively. This will help minimize student failure that is the result of poor

examination construction and also may reduce student test anxiety.

A critical implication for this study involves re-evaluating the extensive use of examinations in assessing student achievement in nursing education. Peplau (1952), a recognized nursing theorist, has postulated that high anxiety has a negative influence on learning. Nursing educators are leaning toward a more humanistic, caring learning environment. If examinations are recognized as a major source of anxiety for nursing students, perhaps using them as the only basis for assessment of student achievement is neither caring nor humanistic. Other evaluation methods may be used in combination for grading purposes. Students who experience difficulty with one method can still be academically successful if they can demonstrate academic achievement with other methods. When examinations are given, the time for completion could be lengthened, or an option to retake a similar examination could be offered. Both of these provisions were found to decrease test anxiety (S. B. Sarason, 1960).

Nursing needs more practitioners who possess advanced nursing degrees. Nursing's credibility, image, influence and growth is largely dependent on the

advanced practice of its members. The recognition and treatment of test anxiety may be one method of retaining capable contributing nurses.



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## APPENDIX A

## Test Anxiety Inventory



# TEST ATTITUDE INVENTORY

Developed by Charles D. Spielberger

in collaboration with

H.P. Gonzalez, C.J. Taylor, G.R. Ross and W.D. Anton

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NAME \_\_\_\_\_ DATE \_\_\_\_\_ SEX M F

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

T \_\_\_\_\_ W \_\_\_\_\_ E \_\_\_\_\_

ALMOST NEVER  
SOMETIMES  
OFTEN  
ALMOST ALWAYS

1. I feel confident and relaxed while taking tests ..... ① ② ③ ④
2. While taking examinations I have an uneasy, upset feeling ..... ① ② ③ ④
3. Thinking about my grade in a course interferes with my work on tests. .... ① ② ③ ④
4. I freeze up on important exams ..... ① ② ③ ④
5. During exams I find myself thinking about whether I'll ever get  
through school ..... ① ② ③ ④
6. The harder I work at taking a test, the more confused I get ..... ① ② ③ ④
7. Thoughts of doing poorly interfere with my concentration on tests ..... ① ② ③ ④
8. I feel very jittery when taking an important test ..... ① ② ③ ④
9. Even when I'm well prepared for a test, I feel very nervous about it ..... ① ② ③ ④
10. I start feeling very uneasy just before getting a test paper back ..... ① ② ③ ④
11. During tests I feel very tense ..... ① ② ③ ④
12. I wish examinations did not bother me so much ..... ① ② ③ ④
13. During important tests I am so tense that my stomach gets upset ..... ① ② ③ ④
14. I seem to defeat myself while working on important tests ..... ① ② ③ ④
15. I feel very panicky when I take an important test ..... ① ② ③ ④
16. I worry a great deal before taking an important examination ..... ① ② ③ ④
17. During tests I find myself thinking about the consequences of failing ..... ① ② ③ ④
18. I feel my heart beating very fast during important tests ..... ① ② ③ ④
19. After an exam is over I try to stop worrying about it, but I just can't. .... ① ② ③ ④
20. During examinations I get so nervous that I forget facts I really know ..... ① ② ③ ④



**Consulting Psychologists Press, Inc.**  
3803 E. Bayshore Road, Palo Alto, CA 94303

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APPENDIX B

Cover Letter and Consent Form

### Cover Letter

You are invited to participate in a study of test anxiety. The purpose of this study is to investigate whether test anxiety is related to grades, the age of students, or both. This research is being conducted by Cynthia Eubank as a requirement for the Master of Science Degree in Nursing at Drake University.

Because you are a full time second year ADN student at Des Moines Area Community College, you are invited to participate. It is hoped that data from this research will provide useful information about test anxiety that may benefit future nursing students.

Your participation will involve:

1. Completion of an inventory which asks you to rate your thoughts and feelings when taking course exams. The inventory will take approximately 10 minutes to complete and will be given during your regular class time.
2. You are asked to list your age in years.
3. You are asked to release your final course grade for ASDN 264 at the end of the semester to the researcher.

The information you provide to the researcher will remain completely confidential and will be secured in a

locked file. Only the researcher will have access to this information. Your name will be kept on file until grade scores can be added to your inventory score and age. At that time the list of names will be destroyed.

Participation in this study is totally voluntary and in no way related to enrollment in ASDN 264, your grade in ASDN 264, or your enrollment at DMACC. You are at virtually no risk to participate in the study. You are assured that no prejudice will result from your decision to participate or not. If you agree to participate you may withdraw at any time prior to completion of ASDN 264.

If you have any questions please ask me. If you would like a copy of the results of this study please include your address with your signature. Your signature on the attached form indicates that you understand the information presented here and agree to participate.

Sincerely,

Cynthia Eubank

## Consent Form

I understand the information presented in the cover letter regarding my participation in the study described. My signature below indicates my agreement to participate in this study.

---

Signature of Participant

---

Age

---

Date

Address (if you would like a copy of results)

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APPENDIX C  
Approval Forms

To be completed by the Investigator:

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Date Submitted: October 21, 1992

Proposal Title: An Investigation of the Relationship Among Test Anxiety, Academic Achievement, and Age in Associate Degree Nursing Students

Investigator: Cynthia Eubank

Faculty research advisor (for student research): Sandra Sellers

Return to: Sandra Sellers, Division of Nursing, Drake University

Name

422 Olin Hall

Street Address or Campus Office

Des Moines, Iowa

City, State, Zip if off campus

To be completed by the Human Subjects Research Review Committee Chairperson:

Date Received: 10/21

Decision:

- ☐ Approval, no risk
- ☒ Approval, minimal risk
- ☐ Approval, subjects at risk, but benefits outweigh risks
- ☐ No approval. Subjects at risk or proposal does not adequately address risks, benefits and procedures.

Reasons for Disapproval: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggested Changes: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Human Subjects Review Committee Chair

Steven F. Faux (1992-1993)

Date: 11/9/92



# Memorandum

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Des Moines Area Community College

To: Deans

From: Susan Wager, Director Nursing Education  
Extension 6316

*/ Susan*

Re: Research Request - Cindy Eubank (Ankany Nursing instructor)

We have received a research request on the relationship between age, test anxiety and ADN 264 course grades

The target audience is Full time Second Year ADN's - Ankany & Boone

I am in support of this project:

\_\_\_\_\_ with no modifications in the proposal or tools.

X providing the following modifications are made:

1. Student instruction sheet modification (see p. 20)
2. Survey done no later than 4 working days before exam to avoid students correlating possible poor test performance to the survey

Please indicate your approval/disapproval below and return to me by \_\_\_\_\_

Thanks.

✓ Approve

\_\_\_\_\_ Disapprove

*K. Phillips*  
Dean's Signature.

Date 11/4/92